

## STATEMENT OF WORK FORMAT

PCN: NNG11403701Q

### Background

- NASA Goddard Space Flight Center's (GSFC) Detector Development Laboratory (DDL) produces multilayer circuits on semiconductor wafers up to 8-inch diameter for technology demonstrations and flight hardware of detector focal planes and other components. An essential tool required to build these circuits is a Mask Aligner for contact printing of device layers on the semiconductor wafers.
- Certain types of essential wafers are only available in 8" diameter. In order to process these wafers in the DDL, these wafers must be resized to 6" diameter with the concomitant yield loss. Another alternative has been to go outside of NASA to use other facilities capable of 8-inch processing, also resulting in yield reduction and logistical difficulties.
- The Mask Aligner is one of the key enabling technologies for 8-inch wafer processing and allows processing of wafers in all sizes up to 8". This will help to alleviate one of the processing "bottle-necks" in the DDL

### Objectives

- The objective of this project is to procure a Mask Aligner capable of processing substrates up to 8" diameter in a variety of modes from proximity to full vacuum contact.
- No prototypes or one-of-a-kind systems will be considered. The unit must be a production model with at least 5 similar units working in the field. The unit **must** be compatible with an existing MA-6 mask aligner which will share the tooling for smaller substrate sizes (2"- 6" diameter substrates).
- Mask Aligner **must** be compatible with SB-6E wafer bonder

### Scope

The scope of this work includes production and delivery of a Mask Aligner capable of processing up to 8-inch diameter wafers to the GSFC DDL. This includes the following:

- a) Design of the Mask Aligner at the vendor location,
- b) Approval of the design by the GSFC technical representative, communicating requirements to GSFC for installation including electrical power needs, gases vacuum and other utilities as required.
- c) Construction of the Mask Aligner at the vendor facility,
- d) Testing of the Mask Aligner at the vendor facility
- e) Crating and Shipping the unit to GSFC where GSFC personnel will install it in the DDL

## Tasks or Requirements

The Supplier will provide a new or refurbished MA-8 Mask Aligner

- Mask Aligner Model MA-8/BA-6 is required for compatibility with existing systems. The MA-8 will share numerous existing wafer chucks and mask holders with an existing MA-6 Mask Aligner. In addition the MA-8 Mask Aligner **must** accept a Transport Fixture for a SB-6E Wafer Bonder
- **Suss Microtec MA-8 ready for BA-6 Wafer Bonding Assembly**
  - **Configured for Top-side Alignment with Dual Video Microscope**
  - **Dual 10X Eyepieces**
  - **Three sets of microscope objectives (two each of 5X, 10X and 20X)**
  - **Microscope Light Source with yellow filter**
  - **Three Position Turret Nosepiece**
  - **UV400 Optics**
  - **Suss CIC 1000 Power Supply**
  - **Exposure modes: Hard, Soft, Vacuum, Flood and Proximity**
  - **Exposure Unit/Lamp Housing , 1000W**
  - **Mercury Lamp, 1000W DC**
  - **Three Vacuum Chucks: 8", 6" and 4"**
  - **Three Mask Holders: 9", 7" and 5"**
  - **Two Mask Holder Frames: One for 7" and smaller, One for 9"**
  - **Video Monitor**
  - **TMC Vibration Isolation Table**
  - **System Power: 230Volt, 3ph, 50-60Hz**
  - **IR Backside Alignment (BSA) Installed (consisting of Infrared Trans Illumination and High Sensitivity Camera for DVM in IR)**
  - **Optical Backside Alignment Ready including MA-8 Separation Enlargement BSA-1 (the MA-8 Mask Aligner will be configured and tested for Optical Backside Alignment but will not be installed on delivery. Training will be provided on changing between IR Backside Alignment and Optical BSA)**
  - **Backside Alignment GAP Image System (consisting of all Fixtures, Tooling and all Parts necessary to implement Optical Backside Alignment including two video microscopes with switchable magnification of 90X and 290X.**
- Supplier will provide Crating and Shipping
- Supplier will provide Installation and Training at NASA/GSFC
- Supplier will provide an Operations Manual printed in clean room paper and full Documentation (One set of Hard Copy Manuals and Documentation)
- Supplier will provide Warranty, 12 Months (Parts and Labor), guaranteed to meet factory specifications

### **Selection Criteria**

- Supplier will have a verified track record of technical competence in providing Mask Aligners for wafer processing.
- Supplier will provide references of users of similar Mask Aligners in a Wafer Processing environment.
- The Mask Aligner must be compatible with an existing Suss MicroTec MA/BA-6 and a SB-6E Wafer Bonder
- The Mask Aligner must function with all current MA/BA-6 Tooling including Wafer Chucks, Mask Holders and Bonding Fixtures
- New construction is preferred but, refurbished Mask Aligners will be considered. In order to be considered, a refurbished unit must meet Factory Specifications and provide a 12-month Warranty
- Installation and Training to be performed by factory trained technician at NASA/GSFC.
- Supplier will provide the Best Value to the government while meeting all of the technical specifications listed in this statement of work

### **Deliverables or Delivery Schedule**

- **Suss Microtec MA-8 ready for BA-6 Wafer Bonding Assembly**
  - **Configured for Top-side Alignment with Dual Video Microscope**
  - **Dual 10X Eyepieces**
  - **Three sets of microscope objectives (two each of 5X, 10X and 20X)**
  - **Microscope Light Source with yellow filter**
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  - Supplier will provide Installation and Training at NASA/GSFC
- Supplier will provide an Operations Manual and full Documentation (One set of Hard Copy Manuals and Documentation)

#### **Delivery Schedule**

Within 15 business days after order is placed, NASA will determine acceptability of proposed unit for refurbishment either by site visit to supplier or by photographs.

#### **Government-Furnished Equipment and Government-Furnished Information**

- No Government-furnished equipment (GPE) and Government-furnished information (GFI) will be required

#### **Security**

- The Supplier Representative who will be installing the Mask Aligner and Training NASA personnel must be a US Citizen

#### **Place of Performance**

- The Construction or Refurbishment of the Mask Aligner shall be performed at the Supplier's facilities
- The Installation and Training shall be performed at NASA/GSFC, Greenbelt , Maryland



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**Signature & Title**

**Joe Santos**

**Facilities Manager for the  
Detector Development Laboratory  
Detector Systems Branch – Code 553**

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**Date**

**August, 4<sup>th</sup>. 2011.**